

# Monitoring Study Group Meeting Minutes

April 21, 2003  
Howard Forest

The following people attended the MSG meeting: Tharon O'Dell (BOF-chair), Tom Spittler (CGS), Peter Ribar (Campbell Timberland Management), John Munn (CDF), Syd Brown (CDPR), Clay Brandow (CDF), Dr. Kate Sullivan (PALCO), Robert Darby (PALCO), Mike Anderson (Anderson Logging Co.), David Kuszmar (NCRWQCB), Matthew Buffleben (NCRWQCB), Dawn Pedersen (CDF), Lois Kaufman (CDF), Brad Valentine (DFG), Joe Croteau (DFG), Bernie Bush (SRCO), Mike Orme (CDF), Gerri Finn (CDF), Dean Lucke (CDF), Mark Rentz (CFA), Roger Poff (R.J. Poff and Associates), Kent Aue (DFG), Dr. Richard Harris (UCCE), Richard Gienger (HWC/SSRC), Chris Hipkin (Statewide Forestry), and Pete Cafferata (CDF). [**Note: action items are shown in bold print**].

We began the meeting with general monitoring related announcements:

- Pete Cafferata announced the second CLFA *Watercourse Crossings Workshop* is scheduled for May 16, 2003 in Redding. There are a few remaining spaces for this session. The contact for further information is Hazel Jackson, CLFA, [clfa@volcano.net](mailto:clfa@volcano.net) or (209) 293-7323.
- Richard Harris stated that a two day conference titled "*California's North Coast Riparian Forests—The Link Between Wood and Fish*" is scheduled for May 2<sup>nd</sup> and 3<sup>rd</sup>. The first day will be at the Mendocino Community College in Ukiah, while the second day will be a field trip to Jackson Demonstration State Forest and Gualala Redwoods Co. watersheds. This conference is focused on measurement, monitoring, and management of large wood in North Coast stream systems. For further information, including a registration packet, contact Sherry Cooper, UCCE, [shcooper@ucdavis.edu](mailto:shcooper@ucdavis.edu) or (530) 224-4902.
- Pete Cafferata informed the group that Gary Schmitt, USFS Pacific Southwest Region, has produced an excellent 29 minute video/CD ROM movie titled "Healthy Soils Build Healthy Ecosystems." This is an educational video developed for use in the western U.S. Copies should be available from Gary at: [gschmitt@fs.fed.us](mailto:gschmitt@fs.fed.us)
- Pete Cafferata provided the MSG with copies of a CD-ROM titled "Landscape Dynamics and Forest Management" which was made by Drs. Lee Benda and Dan Miller of the Earth Systems Institute. Techniques used in the CD include state-of-the-art videography and computer simulation. Landscape and stream channel changes in response to disturbances over decades to centuries are displayed. Disturbances include fires and floods and watershed products routed down stream channels include sediment and wood. CDF helped fund this project and copies are available from Pete ([pete.cafferata@fire.ca.gov](mailto:pete.cafferata@fire.ca.gov)).
- Tom Spittler provided the MSG with copies of Julie Bawcom's paper titled "Clearcutting and Slope Stability: Preliminary Findings on Jackson Demonstration State Forest, Mendocino County, California." This paper will be included in the proceeding of the 24th Annual Forest Vegetation Management Conference held in Redding in January 2003 (contact Sherry Cooper, UCCE, [shcooper@ucdavis.edu](mailto:shcooper@ucdavis.edu) or (530) 224-4902 for the proceedings, or Tom Spittler for a copy of the paper ([tom.spittler@fire.ca.gov](mailto:tom.spittler@fire.ca.gov)).

Clay Brandow provided an update on CDF's Modified Completion Report (MCR) monitoring process. He stated that we appear to be on track for achieving our goal of monitoring a 12.5% random sample of final Work Completion Reports submitted to CDF, based on the number of reports received since November 17, 2002. Quarterly audits continue to be completed using data from CDF's Forest Practice Database, and a MCR training session for new Forest Practice Inspectors will be held this spring. At the request of DFG, MCR monitoring data on watercourse crossings, minus the THP numbers to protect landowner privacy, has been shared with DFG's Interior Timberland Planning program.

Clay stated that Mike Anderson had expressed a concern at the November 17, 2003 MSG meeting about problems associated with using MCR monitoring results from data collected without input from the LTO, RPF, and original CDF Forest Practice Inspector. A prolonged discussion of this concern followed. Mike described a specific situation that occurred in Mendocino County where a practice was rated as "marginally acceptable" during the MCR, when in fact the CDF Inspector, LTO, and RPF had all agreed that the site specific recommendation they developed was superior to the standard Forest Practice Rule. Mike stated that this principle can also be applied to waterbreak spacing, where the standard Rule calls for a spacing of x feet with a given slope and EHR, but on the ground investigation may show that modified spacing will result in greater protection. He emphasized that we do not want to discourage making site specific recommendations in the field, and stated that the connection between the original CDF Inspector, LTO, and RPF is too often lost, but needs to be captured in the MCR monitoring process. Clay stated that, in general, the Inspector who completes the MCR work should be the same Inspector who did the PHI and active inspections for the plan. Gerri Finn pointed out that sometimes CDF Forestry Assistants or Technicians are assigned the MCR. Mark Rentz reasoned that to alleviate this communication problem, it would be beneficial to: 1) send the form out to the various parties, and 2) provide time for them to respond to the information reported on the MCR forms (i.e., explain reasons for inconsistencies with the standard Rules). He also suggested that CLFA breakfast meetings could be used to further communication on the MCR process with practicing field RPFs. Peter Ribar added that we need to formalize the feedback loop process, possibly by simply mailing reports to the appropriate RPF and LTO. Bernie Bush suggested that frequent data summaries should reveal where potential problems are developing, leading to timely corrective measures. Kate Sullivan stated that the whole THP review process is designed to improve practices at the site scale, but it is critical to document in the record the site specific changes agreed to by field personnel.

**Clay offered to do the following items to address Mike Anderson's concerns: 1) make sure that CDF Inspectors, LTOs, and RPFs are aware that the MCR reports are available and will be sent to them upon a request to Clay, 2) inform CDF inspectors that if someone other than the original CDF inspector who completed the PHI and active field inspections does the MCR work, they should communicate with that CDF person prior to the MCR field work, and have the CDF Inspector review the MCR after the field work is completed, 3) summarize data and MCR concerns for CDF Unit Foresters and Resource Managers at the FMC meeting scheduled for late June, and 4) produce regular MCR data summaries for MSG meeting, as well as posting updated MCR data on the BOF MSG website: ([http://www.bof.fire.ca.gov/board/msg\\_geninfo.html](http://www.bof.fire.ca.gov/board/msg_geninfo.html)).**

The next agenda item was a discussion on guidance to CDF on the next steps to take regarding the Hillslope Monitoring Program (HMP). Pete Cafferata began the discussion by providing background information on the topic. In the December 2002 Hillslope Monitoring Report, recommendations were made to: 1) expand the program to more adequately sample non-standard practices and additional mitigation measures, 2) revise the program to take into account Rule changes that have been passed since July 2000--Threatened and Impaired Watersheds Rule Package, and 3) move away from semi-qualitative Rule implementation ratings and toward items that can be quantitatively measured (such as WLPZ riparian stand parameters, new crossing design criteria—including passage of wood and sediment, before and after watercourse crossing abandonment project measurements, and new road segment parameters related to sediment generation). Pete also discussed the benefits of modifying the HMP to include a two phased monitoring approach, where field evaluations occur either before operations (WLPZs, crossing removal sites) or before the first rain storm events following logging and road construction, as well as after significant stressing storm events (as suggested by Lewis and Baldwin (1997) in their statistical review of the HMP). Finally, Pete suggested that the MSG could consider recommending changes in the HMP based on: 1) previous HMP and MCR monitoring results—particularly where the results have been consistent and positive—such as with canopy measurements in Class I and II WLPZs, and 2) the amount of data being generated by the MCR monitoring process—particularly for canopy.

A lengthy discussion of this agenda item followed. Roger Poff stressed that further effort should be expended by CDF to analyze the data that has been collected with the HMP. Basic queries have been run and reported on providing information on Forest Practice Rule implementation and effectiveness, but little effort to date has been made to relate site physical characteristics (e.g., hillslope gradient, road or trail gradient, road prism characteristics, soil type, etc.) to recorded erosion features. Pete Cafferata stated that the 2002 HMP report stated that additional data analysis would be conducted in the future, but clearly with a complex Microsoft Access database, database analysts with considerable skills are required that are not currently available. Clay Brandow suggested that the database could be turned over to a university graduate student for further analysis. John Munn informed the group that many of the questions being asked relate to adequate protection of aquatic habitats, which simple hillslope measurements without instream measurements will not be able to answer.

Richard Harris stated that there is a need to focus on some key hillslope monitoring questions, and possibly the MSG could benefit from an external review group that could provide guidance. Tom Spittler countered this suggestion by stating that the MSG core group has a considerable amount of experience and institutional memory regarding hillslope monitoring and should be able to decide on a future course of action. Mark Rentz suggested that CDF report at a future MSG meeting the general topic areas that could be further explored with the existing HMP dataset. Tharon O'Dell and John Munn stressed that the HMP has been a successful program with the basic questions answered, yielding important conclusions that have been documented in two detailed reports. Training workshops are being held addressing HMP results and Forest Practice Rule package revisions are being developed to address monitoring results.

Kate Sullivan stated that she has been thinking about a new generation of hillslope monitoring for PALCO timberlands in recent months, and that she has been inspired by the Lewis and Baldwin (1997) statistical review of the HMP. She is currently envisioning a nested approach that relates: [forest practice rule implementation] to [site physical characteristics] to [prevention of hillslope erosion] to [desired instream response]. Kate said that this would largely be a research level monitoring effort, and few people in the past have adequately considered the second box dealing with site characteristics. One cannot assume that a given Forest Practice Rule is protective without adequate knowledge of the site characteristics present. As suggested by Lewis and Baldwin, this type of investigation would require data collection before and after large stressing storm events. Clearly, instream measurement cannot be completed everywhere, but must be done in a sufficient number of locations to gain confidence in the outcomes, and could be completed with the approaches suggested by Lewis (CDF and NCRWQCB 2002—Interagency Water Quality Monitoring Workshop Summary Notes). The goal would be that knowledge gained from research level monitoring would eventually allow more simple hillslope monitoring techniques to substituted for research monitoring when and where appropriate. Kate stated that she will be developing this prototype process further and plans to have Jack Lewis, USFS-PSW, review it for statistical validity in the near future.

**Pete Cafferata agreed to undertake the following items to move forward with this topic: 1) work with Roger Poff and Cliff Kennedy to generate a new set of potential queries for the HMP database, particularly related to site characteristics; 2) report at a future MSG meeting the general topic areas that can be further explored with the existing HMP dataset; 3) provide the resource agencies, including the NCRWQCB, an agenda item at the next MSG meeting to provide detailed comments on the HMP work that has been completed to date; and 4) document ideas for the next generation of the HMP program as they are developed.**

Following lunch, Kate Sullivan and Robert Darby provided the MSG with a PowerPoint presentation on the lessons they have learned regarding sediment monitoring on PALCO's timberlands in Humboldt County. Their instream monitoring program has been instigated for several reasons, including: 1) results from sediment budget work, conducted as part of PALCO's HCP, which have documented a considerable amount of sediment generation due to the geologic setting (weak bedrock types, unconsolidated soils, rapid tectonic uplift) and past timber management practices (roads and landslides); 2) HCP monitoring requirements for evaluating the effectiveness of HCP practices in mitigating water quality related problems, and 3) NCRWQCB requirements for instream monitoring related to TMDL development. The parameters being monitored are suspended sediment concentration (SSC), turbidity, and water discharge. As has been documented at Caspar Creek and other sites, the vast majority of sediment movement occurs during strong winter storm events. Conceptually, the following types of monitoring will allow conclusions on HCP effectiveness to be made: 1) compliance (were the management practices implemented correctly), 2) effectiveness (did the practice(s) achieve the desired effect on the watershed process, such as prevention of hillslope erosion), 3) instream effectiveness (how did achieving the desired effects on watershed processes influence instream parameters such as turbidity, SSC, or temperature), and 4) trend (did consistent application of appropriate management practices across the landscape achieve desired conditions, including habitat in downstream locations). These types of monitoring have differing temporal and spatial scales.

Most of PALCO's instream turbidity and SSC monitoring to date has been conducted in the Freshwater Creek and Elk River watersheds. Currently, there are 16 monitoring stations in Elk River and 9 stations in Freshwater Creek. Twenty-two of the 25 stations became operational in November, 2002. Nine of the 25 stations use grab samples only; 16 have equipment for automated sampling. Prior to field instrument installation and data collection, PALCO developed a detailed project plan in conjunction with the NCRWQCB describing how the data would be collected. For example, in Elk River this plan is denoted as "TMDL Monitoring of Sediment in the Elk River Watershed: Quality Assurance Project Plan"(QAPP). Included in the QAPP document are Standard Operating Procedures (SOPs) for data collection, equipment to be used, staffing/training/budget, a QA/QC plan, a description of data management plans, and a reporting schedule. Kate stressed that there is no economy of scale with over 20 stations, and that it is good to have a strong QA/QC plan in place, since there are numerous places in the process that problems can develop. She also stated that it is appropriate to invest a lot of time in developing these documents, and allow sufficient time for approval, equipment purchase, station installation, training, etc. PALCO attempted to complete much of this work between October 1<sup>st</sup> and November 1<sup>st</sup> of 2002, and this was too short a time period. SOPs have been developed for virtually all the field procedures, such as station documentation, discharge measurement, instrument installation and use, grab sample collection, laboratory analysis methods, etc.

Criteria for selecting sample sites included: proper hydraulic function, ability to sample at all flow levels, access during winter floods, safety, and security. While November 2002 was relatively dry, December 2002 was the wettest month on record for Scotia and Freshwater, with over 25 inches of precipitation in the Freshwater Creek basin. The field crew consists of 16 to 18 people during storm events, and training for safety and proficiency has been heavily emphasized. Discharge measurements have been difficult in the larger rivers during high discharge events, since cable ways and torpedo velocity instruments with 50 lb weights are required. Additionally, stage-discharge relationships have changed before and after large storm events due to channel scour and aggradation at some of the stations.

Stations with only water grab samples have cost two times as much to operate as machine sampled stations. Machine sampled stations (ISCO pumping samplers, recording turbidimeters, or recording turbidimeters plus ISCO samplers) allow much more data to be collected, particularly at higher discharges, and are more cost efficient. YSI Sonde recording turbidimeters have been used extensively, but problems with proper calibration have been noted with these instruments. Simultaneous tests with YSI probes, DTS-12 turbidimeters, and ISCO pump samples have revealed significant differences in turbidity measurement, with the YSI indicating almost two times as much turbidity as ISCO samples.

Kate offered several overall lessons learned to date: 1) To detect small changes in sediment levels with varying treatments, such as 20% over background, it is critical to have machine sampled stations (ISCO pumping sampler sufficient). 2) For detecting gross changes, such as 100%+ differences over background, grab samples are sufficient in small basins. 3) For trend monitoring (trends in time or changes in sediment yield), recording turbidimeters are necessary, and if possible, should be used in conjunction with ISCO pumping samplers, as documented by the USFS-PSW Redwood Sciences Laboratory (RSL) with their Turbidity Threshold Sampling

(TTS) approach (see the RSL Turbidity Threshold Sampling website: [http://www.rsl.psw.fs.fed.us/projects/water/tts\\_webpage/tts\\_main.html](http://www.rsl.psw.fs.fed.us/projects/water/tts_webpage/tts_main.html) ). Overall, Kate noted that PALCO spent ~\$400,000 for the first winter season, and expects to spend ~\$200,000 the second season to conduct this level of monitoring. She expects to adopt the RSL TTS sampling techniques in the future to reduce costs. **Kate offered PALCO's SOPs to others who have interest in using them for their monitoring programs.**

Pete Cafferata provided the MSG with a brief update on the three cooperative instream effectiveness monitoring projects with support from the MSG/CDF/BOF planned for the upcoming winter period. Campbell Timberland Management, along with Graham Matthews, is moving ahead with a project in the South Fork Wages Creek basin. A final study plan is expected by the end of April. SPI, working with Dr. Lee Benda, will be developing a study plan for a planning watershed in the Trinity River watershed for their cooperative project. **CDF is in the process of purchasing monitoring equipment to support both these projects and a Memorandum of Understanding (MOU) will be written to document the goals of the project, contributions of each participant, and timeline for project implementation.** Additionally, CDF's Contracts Office is preparing a contract with the Mendocino County RCD for a second phase of the Garcia River cooperative instream monitoring project. CDF will primarily buy monitoring equipment for this project as well. Cooperators in the Garcia project include the NCRWQCB, the landowners, the MCRCD, and MSG/CDF/BOF. Five of the 12 tributaries monitored in 1999 will be instrumented with continuously recording turbidimeters and turbidity spikes will trigger hillslope/channel inspections. Additionally, instream gravel composition and permeability will be remeasured at these five tributaries.

Under the new business agenda item, Richard Gienger stated that it would be beneficial if protocols were developed for better documentation of potential sediment source areas related to timber operations.

Pete Cafferata stated that he is attempting to have Dr. Lee MacDonald, Colorado State University, provide a presentation on his central Sierra Nevada sediment monitoring study to the MSG at the next meeting. **A final date for the next meeting was not set, but potential dates were reserved that tie in with a scheduled trip to California for Dr. MacDonald. These potential meeting dates are: June 16, 17, and 20<sup>th</sup>. Pete Cafferata will email the selected meeting date to the MSG electronic mailing list.**